Linac and IRM Front-ends

Documentation introduction

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The distributed front-end controls software that supports the Linac and numerous other projects at Fermilab has evolved through several generations. At present there are two variations of this software that exhibit nearly identical features.

1. The Internet Rack Monitor (IRM) front-ends use a MVME-162 (25/33 MHz MC68040) CPU board that is housed in a 3-slot VME crate that includes analog and digital I/O interfaces as well as ethernet and clock connections. The software is based on the pSOS operating system kernel.

2. The Linac PowerPC front-ends use a MVME-2401 (233 MHz MPC750) CPU board that is housed in a VME crate. Most of the I/O is sourced via an arcnet network from one or more Smart Rack Monitor (SRM) chassis that include analog and digital I/O interfaces. The PowerPC software is based on the VxWorks operating system kernel.

Most software documentation files apply to both front-end variations. Besides the System software, which is active all the time, two categories of separately-compiled and downloaded programs serve to augment and characterize an individual front-end. A local application (LA) performs closed loops, supports various network protocols, or adds other functionality not covered by the basic System software. A page application (PA) uses a 16 x 32 character "little console" interface. Each PA supports system configuration and diagnostic analysis to confirm overall system operation. Nodes lacking "little console" hardware can be accessed via a client running a "Page G" emulator of the same user interface.

The documentation is also divided into three parts: System, LA and PA. Each part is further divided hierarchically according to the number of files available. A good place to start might be the document *IRM Software Features*, or its smaller kin, *IRM Software Overview*. The author of both the original front-end software and all related documentation, except where noted otherwise, is Robert Goodwin.

The original front-end System software was written in assembly code, with the LAs and PAs written in Pascal. Robert Peters ported it all to C for the PowerPC. Mike Sliczniak is a recent valuable addition to the software staff. Mike Kucera leads the hardware group that also includes Robert Florian and Dean Arveson, all of whom provide operational analysis and configuration support, often via Java-based client code written by Robert Florian. Mike Shea provided the original leadership and vision for all of us.